



Attorney Docket No. 9052-98

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Bain et al.

Serial No.: 09/980,219

Filed: April 18, 2002

For: ADHESIVE COMPOSITION COMPRISING THERMOEXPANDABLE
MICROCAPSULES

Group Art Unit: 1711

Examiner: Foelak

RECEIVED
NOV 21 2003
TC 1700

Date: November 13, 2003

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

RESPONSE TO OFFICE ACTION

Sir:

The Office Action dated May 15, 2003, has been received and reviewed. Claims 1-32 are pending in this application. Claims 26-32 have been withdrawn from further consideration by the Examiner as being drawn to a non-elected invention. Applicants respectfully request reconsideration of the application in view of the following remarks, the attached declaration with examples, and the attached CD-ROM.

I. Rejections under 35 U.S.C. § 103(a)

Claims 1-25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hartman et al., Everaerts et al., Makhlouf et al., Gehlsen or EP 0717091. Applicants respectfully traverse this rejection for at least the reasons set forth below. Applicants have additionally included a 132 declaration along with two exhibits, including a CD-ROM, to place evidence on the record that the reference does not produce the same results as claimed when the microspheres are expanded.

To establish a prima facie case of obviousness, the prior art reference or references when combined must teach or suggest *all* the recitations of the claim, and there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. M.P.E.P. § 2143. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. M.P.E.P. § 2143.01, citing *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). To support combining references, evidence of a suggestion, teaching,

or motivation to combine must be clear and particular, and this requirement for clear and particular evidence is not met by broad and conclusory statements about the teachings of references. *In re Dembiezak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). The Court of Appeals for the Federal Circuit has also stated that, to support combining or modifying references, there must be particular evidence from the prior art as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000). Furthermore, as recently affirmed by the Court of Appeals for the Federal Circuit in *In re Sang-su Lee*, a factual question of motivation is material to patentability, and cannot be resolved on subjective belief and unknown authority. *See In re Sang-su Lee*, 277 F.3d 1338 (Fed. Cir. 2002). Respectfully, as will be discussed below, the Official Action fails to meet the requirements for a prima facie showing of obviousness under § 103.

Applicants submit that Hartman et al. do not teach or suggest the present invention. Hartman et al. discloses a double-sided multi-layered tape, containing a substantially uniform distribution of pre-formed voids (See, Fig. 1). The voids, which are at least an order of magnitude greater than those of the microspheres, are generated by a blowing agent and not by thermally expandable microspheres. The voids give the core layer compressibility. Thus, the voids are not formed as a result of thermoexpandable microspheres. Moreover, the voids do not deactivate the adhesive properties of the composition at an interface where it is applied/attached. In other words, Hartman et al.'s thermoexpandable microspheres are expanded not to deactivate chemical bonding, but to generate large preformed voids to give core layer compressibility.

As we have previously argued, Hartman et al. state at column 12, lines 33 to 37, that its tape comprises "a hot formed multilayer carrier including a core layer formed of a thermoplastic elastomer matrix containing a substantially uniform distribution of voids generated by a blowing agent comprising thermally expandable microspheres and at least one skin layer formed of a film-forming thermoplastic polymer, said core layer having a void volume determined by the proportion of blowing agent in the core layer and by the degree of expansion thereof. . . ." This differs from the present invention where, as recited in claim 1, the microspheres each comprise a shell that encapsulates at least one expandable gas which evaporates without creating voids in the matrix, as the microspheres remain integral with their expanded skin. Thus, in the expanded matrix of the present invention, there are no

voids, but instead, expanded microspheres having their expanding liquid vaporized through their shells without creating any voids in the matrix. As a consequence, the expanded microspheres of the present application remain integral, and part of the blowing agent remains encapsulated inside the microsphere shell in a liquid state with the air filling the rest of its expanded volume in order to remain expanded. Therefore, the present invention generates a cotton-wool like residue at the interface, thus enabling the chemical bonding to reduce to zero. The present invention thus has no voids in the matrix, no compression and no change in the consistency of the structure of the adhesive matrix.

Applicants further submit that there is no teaching nor suggestion to one of skill in the art in Hartman et al. to provide a composition with thermoexpandable microspheres that can release only part of their contents at an interface to deactivate an adhesive without forming voids in the matrix as taught by the present invention.

In contrast to Hartman et al., the present invention uses microspheres that do not produce voids, but are present in an unexpanded state in the final product and do not degrade the structure of the adhesive thermosetting materials for over 10 years. Applicants further submit that the attached declaration of Dr. Manfre further illustrates the differences between Hartman et al. and the present application. Accordingly, Applicants submit that the present invention is not obvious in view of Hartman et al. and that the rejection be withdrawn.

Applicants submit that Everaerts et al. similarly fail to teach or suggest the present invention. Everaerts et al. teach a clear and essentially colorless adhesive containing an abundance of polymerizing materials that, by heating or by subjecting the material to UV radiation, realizes a tackified pressure sensitive tape for use with material substrates such as metal and plastic panels. Everaerts et al. disclose a foam-like pressure sensitive adhesive tape/sheet. The contribution of the thermally expanded plastic microspheres is to create a pressure sensitive tape by foaming in order to make a tape with suitable pressure tackiness on the substrate which, due to the expanded higher thickness, gives more rigidity (column 10 lines 29-44 and 54-62). Thus, Everaerts et al.'s microspheres are used for creating pressure from foaming voids. As previously noted above, there are no voids in the present invention.

Applicants further note that there is no teaching in Everaerts et al. towards thermally expandable microspheres for **de-bonding** or **adhesion deactivating** at an interface where the composition is applied as with the present invention as recited in Claim 1 of the present invention. Thus, Everaerts et al. do not teach the presently claimed invention of a

composition comprising an adhesive agent and dispersed therein thermoexpandable microcapsules. Therefore, Applicants respectfully request withdrawal of this 35 U.S.C. § 103(a) rejection. Applicants further submit that the attached declaration of Dr. Manfre further illustrates the differences between Everaerts et al. and the present application.

Applicants submit that the Makhoul et al. reference also fails to teach or suggest the presented invention. Makhoul et al. teaches a method of reinforcing thin rigid plates by spraying a curable composition onto one side of the rigid plate and curing the polymer composition while only in contact with the rigid plate. Makhoul et al. further teaches thermosetting compositions containing thermosetting epoxy resins, expandable microspheres, particulate reinforcing materials such as milled glass and carbon fibers. The thermally expanded microspheres are used to avoid shrinkage of the composite thermosetting materials (column 3 lines 46-47), by using microspheres to increase the volume of the plastic or reduce its density. Makhoul et al. fails to teach or suggest expansion causing adhesion deactivation of bonded surfaces as recited in Claim 1 of the present invention. Applicants further submit that the attached declaration of Dr. Manfre further illustrates the differences between Makhoul et al. and the present application. Accordingly, Applicants submit that the presently claimed application is not obvious in view of Makhoul et al.

Gehlsen et al. also fail to teach or suggest the present invention. Gehlsen et al. teach the production of foam articles with substantially smooth surfaces (column 2 line 57 –60), “foam-in-place” articles (column 5 line 16-18), pressure sensitive adhesives and adhesive foams (column 5 lines 6-9). Gehlsen et al. disclose the production of foam articles formed by melt mixing a polymer composition and microspheres. The expandable and unexpandable microspheres are used for producing a foam, *i.e.*, a matrix with voids. As noted *supra* in the discussion under Hartman et al., the present invention is not a matrix with voids. Thus, there is no suggestion nor any teaching of the microspheres causing adhesion deactivation of bonded surfaces by partial leakage of their contents as recited in Claim 1 of the present invention. Applicants' compositions comprise thermoexpandable microspheres that are adhesion de-activating, not activating as taught by Gehlsen et al. (See, column 5, lines 8-9) and thus substantially differ from this reference. Additionally, Applicants note that the present invention includes examples of hot melt adhesive compositions (See, Examples of Gehlsen et al.). Therefore, the presently claimed application is not obvious in view of Gehlsen et al. Applicants further submit that the attached declaration of Dr. Manfre further

illustrates the differences between Gehlsen et al. and the present application. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections based on Gehlsen et al.

Additionally, Applicants submit that EP 0717091 (hereinafter "the '091 application") fails to teach or suggest the present invention. The '091 application teaches a pressure sensitive foam comprising a complexity of polymer materials and temperature activated expandable particulate materials. The expandable particulate materials comprise a polymeric shell and a volatilizable liquid core to provide volume change. The '091 application fails to teach or suggest that microspheres cause adhesion deactivation of bonded surfaces by partial leakage of their contents as recited in Claim 1 of the present invention. Therefore, Applicants respectfully request reconsideration of the claims in view of these arguments. Applicants further submit that the attached declaration of Dr. Manfre further illustrates the differences between the '091 application and the present application.

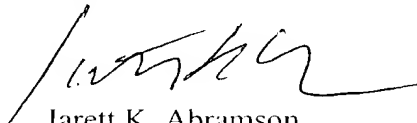
As noted above, Applicants have further enclosed a declaration from Giovanni Manfre, Ph. D. one of the named inventors of the present application. This declaration further illustrates the vast differences between one of skill in the art and the elements of the claims of the present application. Applicants have also further enclosed Exhibit A, which is a comparison that refutes the Office Action's assessment that there is no evidence to show that the references do not produce the same results as claimed. Exhibit A demonstrates a comparison between the thermoexpandable microcapsules as claimed in the present application and the compositions in the cited references. Additionally, Applicants have provided a CD-ROM of a "real time" experiment illustrating the different rates and extent of expansion of the cited reference microbeads as compared to those of the presently claimed application.

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CONCLUSION

In view of the remarks and exhibits presented herein, Applicants respectfully submit that the claims in the instant application define patentable subject matter. If questions should remain after consideration of the foregoing, the Examiner is kindly requested to contact Applicants' attorney at the address or telephone number given herein.

Respectfully submitted,



Jarett K. Abramson
Registration No. 47,376

Enclosures:

132 Declaration
Exhibit A
CD-ROM No. CDQ74N4 entitled De-Bonding

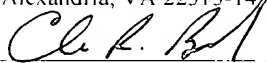
Myers Bigel Sibley & Sajovec, P.A.
P. O. Box 37428
Raleigh, North Carolina 27627
Telephone: (919) 854-1400
Facsimile: (919) 854-1401
Customer No. 20792

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Clara R. Beard